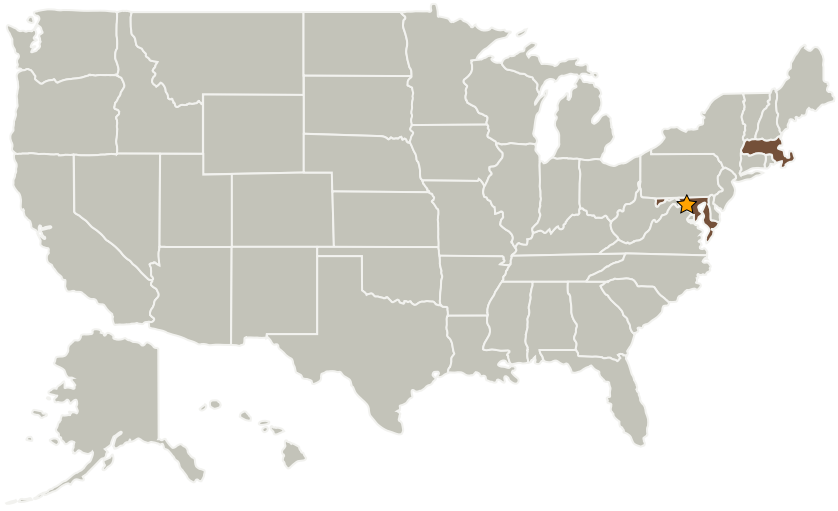
A Wide-band, Ka-band Amplifier and Radar System for Precipitation Retrievals, Phase I

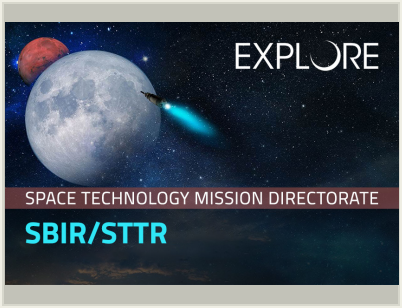
Completed Technology Project (2004 - 2004)

Project Introduction

NASA is committed to measuring precipitation on a global scale. In 1997, NASA launched the Tropical Rain Measuring Mission which carried the first spaceborne precipitation radar (PR). Operating at 13.8 GHz, the PR demonstrated the potential of spaceborne radars to map global precipitation. To improve rainfall estimates, the next generation system being proposed for the NASA Global Precipitation Mission is a dual-wavelength (Ku/Ka-band) PR. While operating at two different frequencies will yield additional information on the drop size distribution, it will also mean a significant increase in size, mass, power consumption and cost. The proposed Phase I effort will investigate the required innovations to design and build a Ka-band differential frequency PR. Such a system will potentially provide the same advantages as a dual-band PR without the same increase in size, mass, power and cost. This Phase I study will focus on developing a wide-band (10% BW) Ka-band amplifier, a wide-band matched-beam single aperture antenna and a novel Ka-band differential frequency PR system design. This design will lead to a prototype system that can be flown on high-altitude platforms such as the NASA ER-2.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Remote Sensing Solutions, Inc.	Supporting Organization	Industry	Barnstable, Massachusetts

Primary U.S. Work Locations	
Maryland	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

James R Carswell

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves